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Memorandum

Date: **March 15, 2011**

To: **LaDonna Turner, Site Assessment Manager**
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: **Dana Bahar, Manager**
New Mexico Environment Department, Ground Water Quality Bureau, Superfund Oversight Section

Subject: **Pre-CERCLIS Screening Assessment of the Tom Mine Site, Ambrosia Lake Mining District, Cibola County, New Mexico: Further Investigation under CERCLA Recommended**

Site name	Tom Mine (NM0127)	**Street address**	Not Applicable		
City	Not Applicable	**State**	New Mexico	**Zip code**	Not Applicable
County	Cibola County				
Latitude	35°12'18.97" N	**Longitude**	107°47'42.68" W		

Site physical description:
The Tom Mine (Site) is located approximately five miles northeast of U.S. Interstate 40 near Grants, New Mexico (see Figure 1). The Site is situated on Bureau of Land Management (BLM) property, and access to the Site is through private property. The Site is characterized as a "dry" surface mine with no mine shafts, adits, or declines, encompassing a total disturbed area of approximately 0.3 acres. The Site is situated on the northwest slope of Grants Ridge at an elevation of approximately 7,200 feet above mean sea level, and a small southeast-northwest trending arroyo/ephemeral stream is located approximately 0.3 miles below the Site on the northwest slope of the ridge.

Site identification:
The Site identification number is NM0127, according to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD) database. The Site is one of 97 legacy uranium mines identified within the Ambrosia Lake mining district of the Grants Mineral Belt. Historically, the Tom Mine was also known under aliases such as "Tom No. 13, Tom Group, and Vanadium."

Site summary:
Based on Orin J. Anderson's observations (1980), the Site consists of several small areas of rim stripping and bench cuts in the Todilto limestone host rock. According to Anderson (1980), scintillometer readings were as high as 900 counts per second (about 10 times background) at a 35-ft wide by 100-ft long east/west trending bench cut that exposed a dark-colored zone (4 to 5-inch thick) in the Todilto limestone formation.

Based on field reconnaissance performed in April 2010 by MMD's contractor, Intera Incorporated (Intera), specific mining features that were observed include five bench cuts and three small waste rock piles across the Site.

As part of the field observations, Intera conducted a radiological survey and recorded gamma radiation measurements at a background location and 11 survey locations within disturbed areas at the Site. Measurements were taken at the ground surface and four feet above the ground surface at each survey point using a Ludlum 192 Ratemeter to record gamma radiation in micro Roentgen per hour (µR/hr).

The gamma radiation level at the background location (ground surface and 4-foot level) was 8 µR/hr. Across the Site, gamma radiation measurements ranged from a minimum of 6 µR/hr to a maximum of 360 µR/hr at the surface of a bench cut that had some yellow uranium mineralization on fracture surfaces. Measurements taken at the 4-foot level indicated a maximum gamma radiation reading of 40 µR/hr. Five surface measurements exceeded the background level by a factor of three times (i.e. greater than 24 µR/hr), and four of these locations also exceeded 24 µR/hr at the 4-foot level.

Targets:
Based on a query of the New Mexico Office of the State Engineer (OSE), Water Rights Reporting System database, from a total of 101 well records (Table 1), there are 48 private/domestic wells within a 4-mile radius of the site (Figure 1). The nearest domestic well is located approximately 1.7 miles northwest of the Site; however, there is no residence associated with this well. The area surrounding the Site is predominately range land, and there are no municipal water supply wells within a 4-mile radius of the Site. The depth to ground water is approximately 115 feet below ground surface in a livestock well located approximately 0.75 miles east of the Site (Table 1). NMED Superfund Oversight Section (SOS) staff sampled a livestock well located approximately 2.4 miles northeast of the Site in March 2009. The ground water sampling results indicate that total dissolved solids, sulfate, and nitrate/nitrite exceed the New Mexico Water Quality Control Commission (NMWQCC) standards for these contaminants. In addition, dissolved uranium was detected at a concentration of 0.041 milligrams per liter (mg/L), which exceeds the NMWQCC standard (0.03 mg/L).

The surface water pathway has been evaluated and contaminants could potentially migrate offsite via surface water runoff to a small southeast-northwest trending arroyo/ephemeral stream that is located approximately 0.3 miles below the Site on the northwest slope of Grants ridge.

Radiological surveys were conducted (as described in the site summary above) and used for the evaluation of the soil exposure pathway. Soil exposure from elevated radioactivity is limited (but not completely controlled) since access to the Site is through private property. No data acquisition was performed for the evaluation of an air pathway.

Site ownership and Potential Responsible Parties:
The Site is under BLM ownership. Surface mining was conducted by the Anaconda Company from 1954 to 1955.

File review:
The references listed below were reviewed for the development of this pre-CERCLIS screen.

Site reconnaissance:
Orin J. Anderson of the New Mexico Bureau of Mines and Mineral Resources visited the Site in 1980. Intera Incorporated, a contractor to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, visited the Site and conducted a radiological survey on April 16, 2010. NMED-SOS staff did not visit this Site as part of the PCS assessment.

Recommendation:
Further investigation of the Site under CERCLA is recommended to assess any physical hazards as well as the areal extent of elevated radioactivity (three times greater than background) to determine if threats to human health and the environment exist.

Based on field reconnaissance conducted in April 2010, radioactivity readings ranged from 6 to 360 µR/hr. Five surface measurements (at bench cuts) exceeded the background level (8 µR/hr) by a factor of three times (i.e. greater than 24 µR/hr), and four of these locations also exceeded 24 µR/hr in readings taken at four feet above the ground surface.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water impacts from "dry" mines such as this Site could potentially impact the alluvial ground water system through leaching of contaminants from waste rock piles. Furthermore, contaminants could potentially migrate offsite via surface water runoff to a small southeast-northwest trending arroyo/ephemeral stream that is located approximately 0.3 miles below the Site on the northwest slope of Grants ridge.

A comprehensive investigation of potential impacts to ground water from "dry" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Depending upon the results of this investigation, site-specific ground water characterization activities may be warranted.

References:

Anderson, Orin J., 1980, Abandoned or Inactive Mines in New Mexico. New Mexico Bureau of Mines and Mineral Resources, Open-file Report 148.

New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, May 2010, Abandoned Uranium Mine Site Assessment for the Tom Site (NM0127), Final Report prepared by Intera Incorporated.

New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, 2007, Abandoned and Inactive Uranium Mines Database.

New Mexico Environment Department, Superfund Oversight Section, 2010, Geochemical Analysis and Interpretation of Ground Water Data Collected as part of the Anaconda Company Bluewater Uranium Mill Site Investigation (CERCLIS ID NMD007106891) and San Mateo Creek Site Legacy Uranium Sites Investigation (CERCLIS ID NMN00060684), McKinley and Cibola County, New Mexico. Draft Released May 2010.

New Mexico Office of the State Engineer (OSE), 2010, New Mexico Water Rights Reporting System Database, Point of Diversion by Location, 4-mile Radius of Tom Mine.

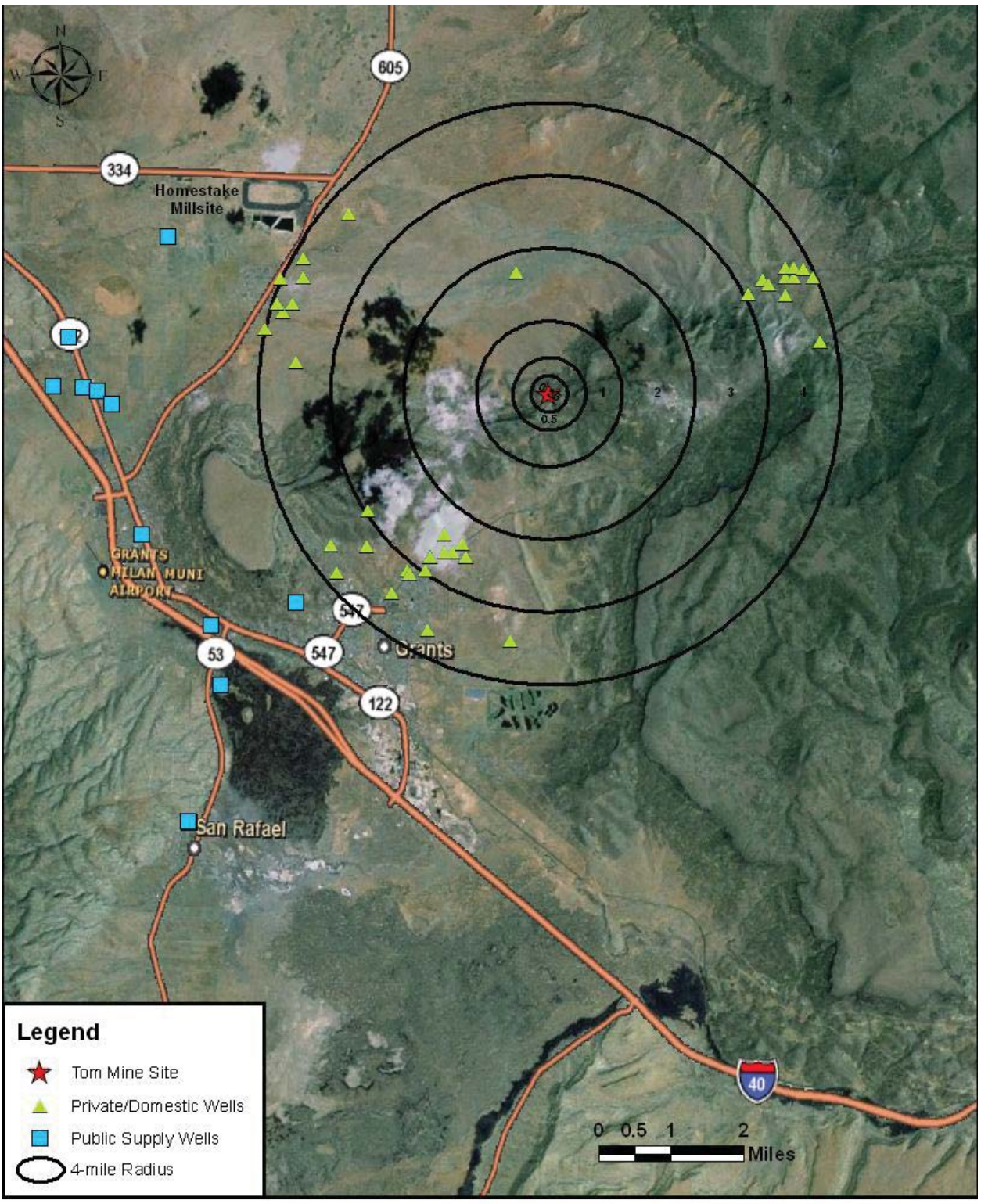

Figure 1: Wells within a 4-mile Radius of the Site (OSE 2010)

Table 1: All Records for Private Wells within a 4-mile Radius of the Site

Well Use (OSE Designation)[1]	Domestic & Livestock (DOL), Domestic-One Household (DOM), and Domestic-Muliple Households (MUL)[2]		Irrigation (IRR), Livestock (STK), and Sanitary/Commercial (SAN)		Exploration (EXP), and Monitoring (MON)		Other/Unassigned		Totals
Distance from Site (miles)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells
0 to 0.25	0	NA	0	NA	0	NA	0	NA	0
0.25 to 0.5	0	NA	0	NA	7	ND : 49-128	0	NA	7
0.5 to 1	0	NA	1	115 : 300	13	ND : 49-551	0	NA	14
1 - 2	1	42 : 142	2	ND : ND	3	ND : 344-486	0	NA	6
2 - 3	11	58-105 : 98-540	2	70 : 160-450	0	NA	0	NA	13
3 - 4	36	50-200 : 82-630	6	100-290 : 255-490	16	32-137 : 74-360	3	69 : 92-125	61
Totals by Category	**48**		**11**		**39**		**3**		**101**

Footnotes:

[1] New Mexico Office of the State Engineer (OSE), 2010, New Mexico Water Rights Reporting System Database, Point of Diversion by Location

[2] Private/Domestic Wells shown on Figure 1.

ND No Data/Not Determined

NA Not Applicable